

Structures, Processes, and Responses in Animals

6-3 The student will demonstrate an understanding of structures, processes, and responses in animals that allow them to survive and reproduce. (Life Science)

6.3.3 Compare the response that a warm-blooded (endothermic) animal makes to a fluctuation in environmental temperature with the response that a cold-blooded (ectothermic) animal makes to such a fluctuation.

Taxonomy level: 2.6-B Understand Conceptual Knowledge

Previous/Future knowledge: In 3rd grade (3-2.2), students explained how hibernation allowed animals to survive. This is the first grade students have been introduced to the concepts of endothermic and ectothermic (6-3.1).

It is essential for students to know the characteristics of endothermic and ectothermic animals and how these animals respond to changes in their environmental temperatures. Animals that are vertebrates differ in their abilities to regulate body temperature.

Warm-blooded (endothermic)

- Animals, including birds and mammals, which maintain a nearly constant internal temperature and do not change with the temperature of the environment.
- When the outside temperature is too hot, an endothermic animal can cool off by sweating, panting, changing position, or changing location. Sweating and panting generate heat loss through evaporating water. Changing position and location allow the animal to find a cooler environment in the shade or shelter.
- Endothermic animals must eat much more often than ectothermic animals since it takes energy to maintain a constant body temperature. For example, a lion must eat its weight in food every seven to ten days.

Cold-blooded (ectothermic)

- Animals, including fish, amphibians, and reptiles, which have an internal body temperature that changes with the temperature of the environment.
- They must gain heat to perform internal activities (for example digestion).
- If the environment is cold, ectothermic animals become slow moving and sluggish. Some animals must bask in the Sun (for example snakes or lizards) or move to a warmer area (for example some fish) before they can move about to hunt for food.
- If the temperature gets too hot, ectothermic animals will need to find a cooler temperature or burrow in the ground to keep its body cool.
- If an animal is cold blooded, they take on the temperature of their surroundings so they don't have to use food energy to keep warm. This means they don't have to eat as often.

It is not essential for students to understand the chemical processes involved with warm-blooded and cold-blooded animals.

Assessment Guidelines:

The objective of this indicator is to *compare* responses of cold-blooded (ectothermic) and warm-blooded (endothermic) organisms to their environment; therefore, the primary focus of assessment should be to detect similarities and differences in ectothermic to endothermic organisms. However, appropriate assessments should also require students to *identify* organisms that are cold-blooded and those that are warm-blooded; *exemplify* responses that would occur due to changes in the environment; or *classify* organisms as endothermic or ectothermic.